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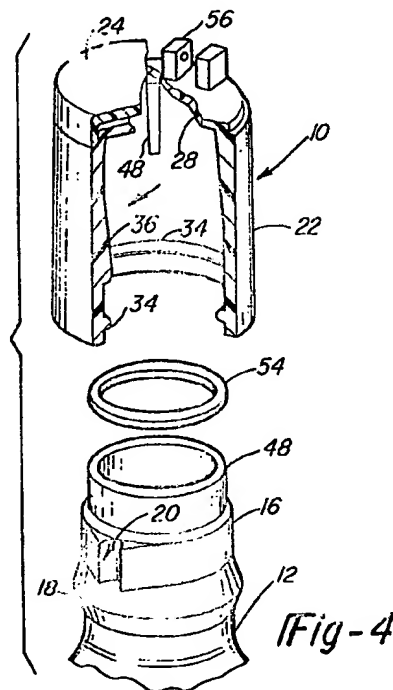
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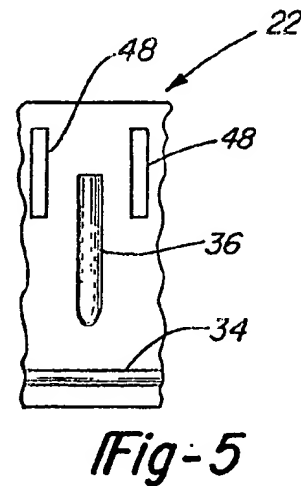
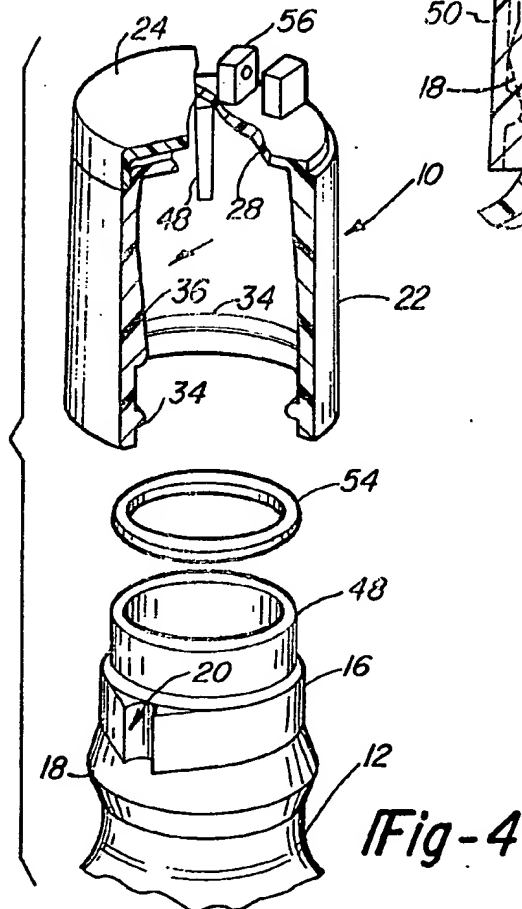
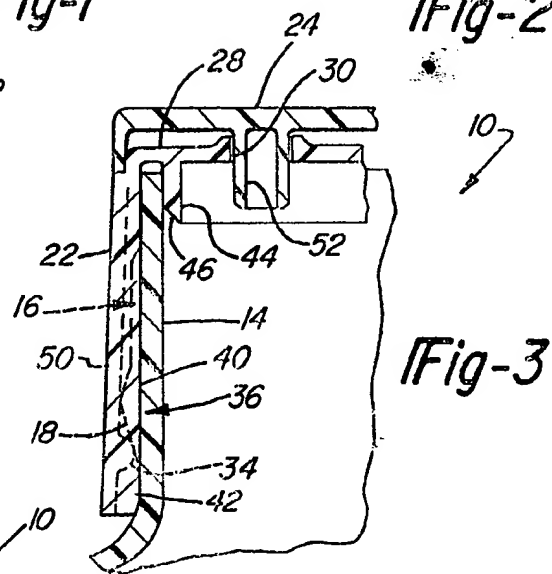
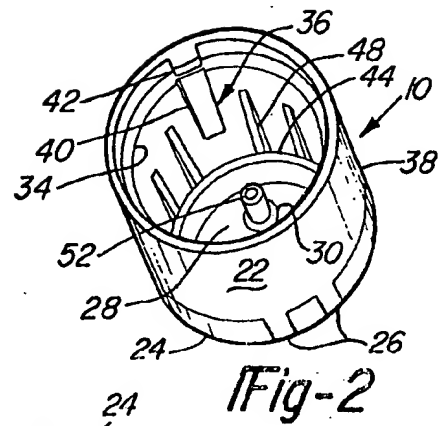
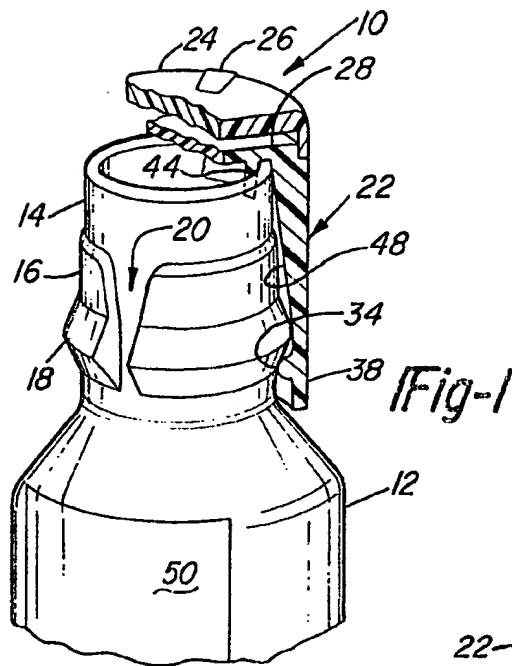
(54) Dispensing closure

(57) A dispensing closure (10) comprises a lid (24) attached to a cap (22) having a depending skirt by a hinge (56), the lid closing off a dispensing orifice in the cap when closed. The closure (10) is adapted to be fastened to the neck of a container (12) by means which ensure that the closure is in a pre-determined orientation relative to the container. This could be the snap-fit of an axial rib (36) provided on the inside of the skirt with a stop-slot (20) provided in the outside wall of the neck. The stop slot could be defined by two lugs one of which has a cam surface. Additionally or alternatively the cap could engage the neck by means of co-operating screw threads and axially extending stop surfaces provided at the ends of the threads to limit the screwing of the cap.



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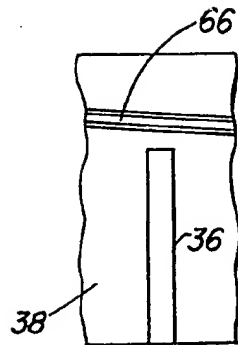


Fig-8

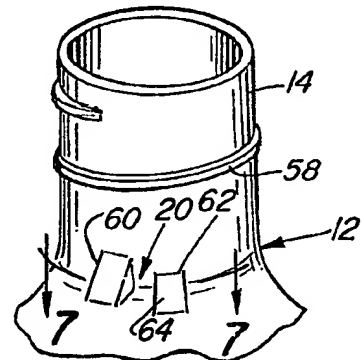
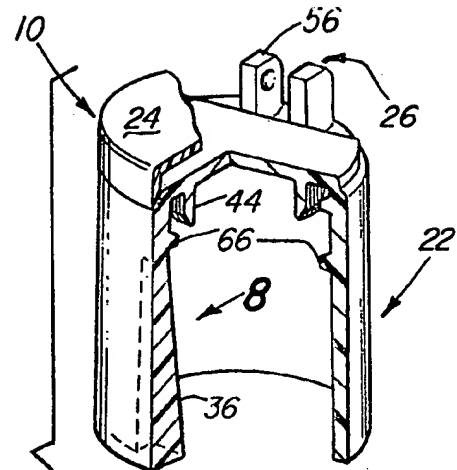


Fig-6

Fig-7

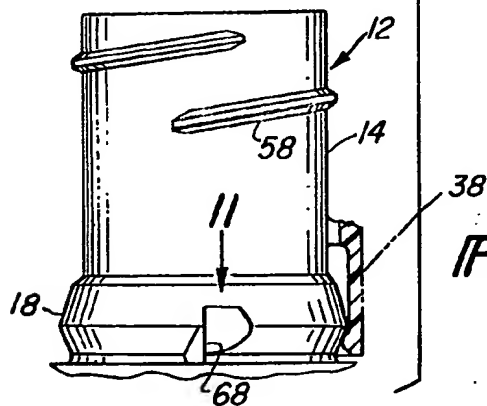
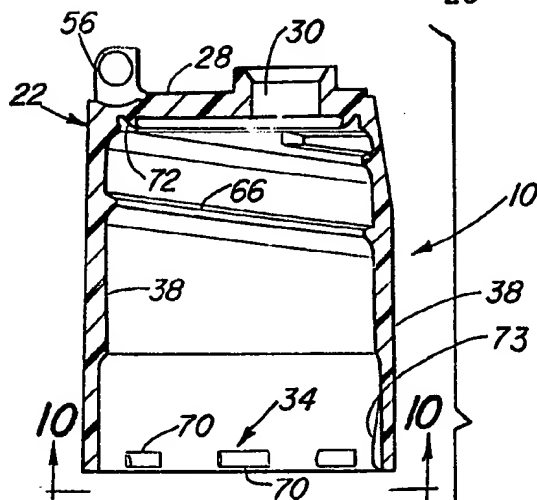
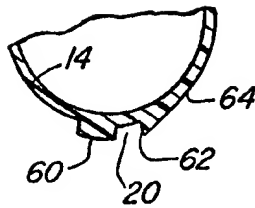


Fig-9

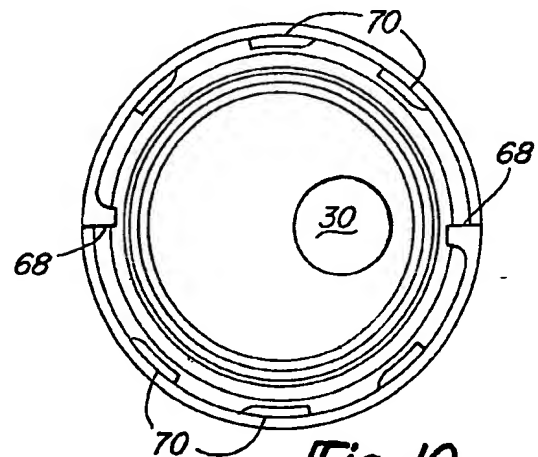


Fig-10

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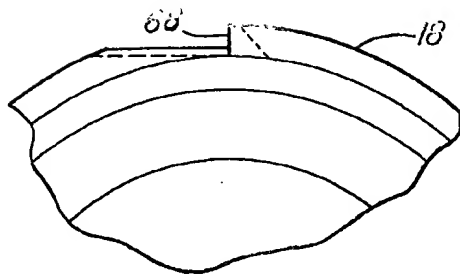


Fig-11

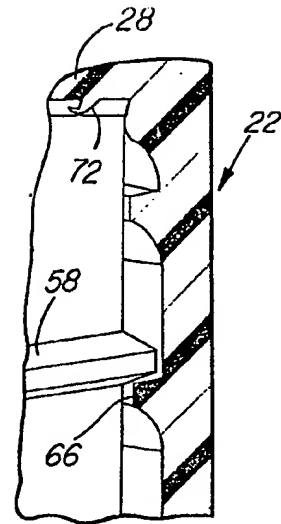


Fig-12

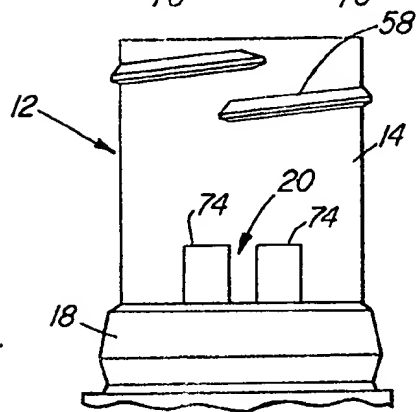
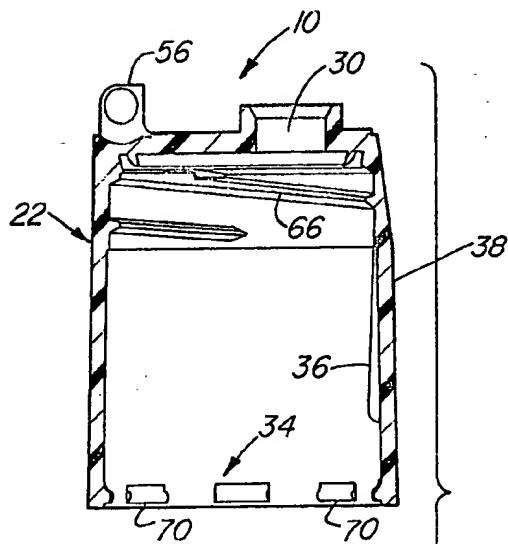


Fig-13

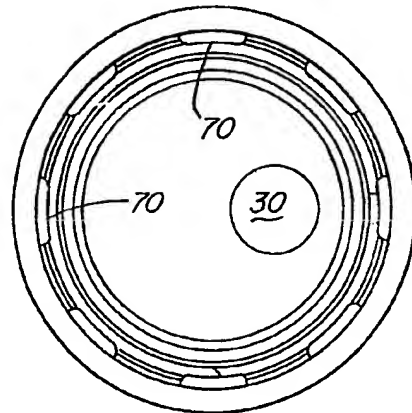
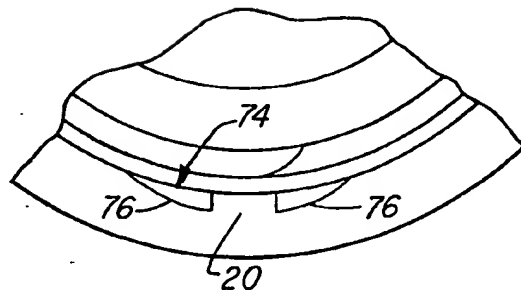


Fig-14

Fig-15



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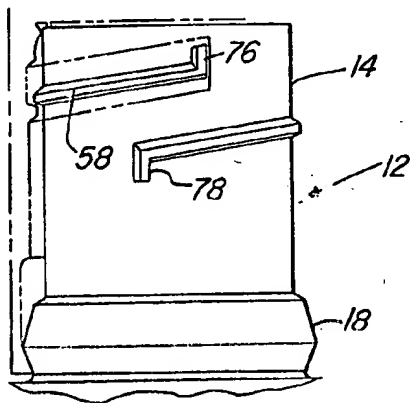
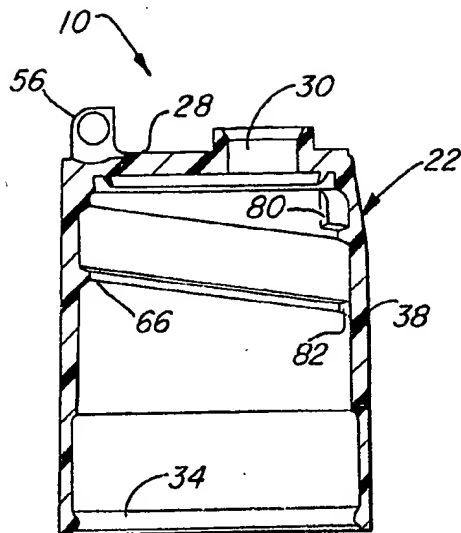


Fig-16

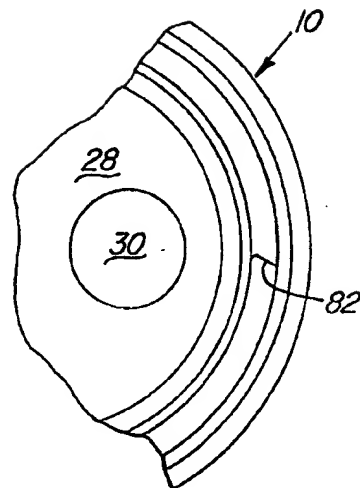


Fig-17

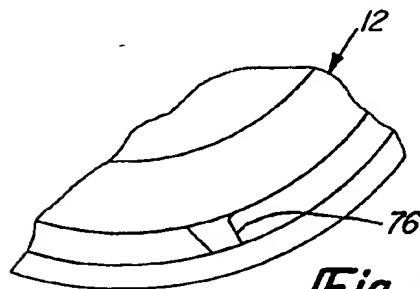


Fig-18

SPECIFICATION

Dispensing closure

- 5 This invention relates to a dispensing closure, and more particularly, to a closure having a base cap containing a dispensing orifice and means for attaching the base cap to a container, and a lid hinged to the cap for closing the orifice.
- 10 Dispensing closures are made with a variety of means for attaching the base cap of the closure to a container. Typically the closure has a base cap provided with a flat top containing the dispensing orifice and a depending skirt which contains means
- 15 which co-operate with the container to attach the base cap to it. A common fastening means uses mating threads on the inside of the skirt of the cap and the outside of the neck of the container. Other means can involve a flange on the neck of the
- 20 container and a bead on the skirt which snap over each other when the cap is pushed onto the container. Another fastening device involves the use of an intermediate sealing gasket which is located and coacts between the inside of the top of the cap
- 25 and the top lip of the container. In this latter case, the sealing gasket can effect a permanent connection between the cap and container by a heat fusing technique or by the use of adhesives on both sides of the gasket material.
- 30 In all of the aforementioned fastening means, the closure becomes affixed to the container at a random orientation. A specific point on the closure, such as the hinge location, may have any random position relative to a fixed point on the container. Normally
- 35 this is not objectionable, but there are instances in which it is desirable to align the hinge, or the dispensing orifice, with the front of a container for ease in pour dispensing or for aesthetic alignment with a label on the front of a container. Random
- 40 orientation occurs when the cap is threaded onto the container by capping machinery which stops when the thread resistance reaches a specific point or in conventional capping machinery which pushes the closure bead over a container flange. Since the
- 45 containers and closures are often made by different manufacturers, and it is costly to maintain tolerances on thread positioning, a previously unrealised practical solution for assuring a fixed orientation between the closure and container is the subject of the present invention.
- 50 It is, therefore, an aim of this invention to provide a closure having means for obtaining a fixed orientation of the closure relative to a container to which the closure is to be attached.
- 55 According to the invention we provide a dispensing closure for use with a container which has a neck provided with an axial stop and means for attachment of the container to the closure, the closure comprising a base cap having a top which
- 60 has a dispensing orifice and from which depends a cylindrical skirt having means for attachment to the container complementary to the means for attachment provided on the container, a lid joined by a hinge to the base cap to enable the lid to be swung
- 65 from a closed position in which it covers the

- dispensing orifice to an open position in which the contents of the container may be dispensed through the dispensing orifice, the dispensing closure also comprising axially extending rib means projecting
- 70 inwardly from the skirt at a fixed orientation relative to the hinge and positioned so as to contact the stop of the container when the closure is attached to the container, thereby establishing in use a fixed orientation of the dispensing closure with respect to the container.

- 75 The invention may provide means for obtaining a fixed orientation of the closure on a container independent of the fastening means used to attach the closure to the container, and independent of the means used for providing a seal between the base cap and the container.

- The invention provides a dispensing closure which has means for alignment of the closure with respect to the container and this preferably achieves an
- 85 alignment of the hinge between the closure lid and cap with the front or labelled portion of the container. The dispensing orifice is thus also aligned with the container labelling. The packaged product may thus be arranged with the container labels
- 90 facing in one direction with the closure caps also so aligned to present an aesthetically pleasing display.

- The lid and base cap may be molded as a single piece with a live hinge joining the lid to the base cap, or the lid and base cap may be molded separately
- 95 with a hinge for joining the two.

- In the preferred embodiment of the invention employing a two-piece closure, the hinge is formed by a pair of posts projecting from the lid, or the base cap, which engage complementary slots in the other
- 100 of the base cap or lid, as more particularly described in United States Patent Application Serial No. 825464 filed February 3, which in a continuation two-part of Serial No. 664553 filed October 25th 1984, entitled 'Two-Piece Dispensing Closure'.

- 105 A desired fixed orientation of the closure hinge and hence the lid opening with respect to the container can be achieved conveniently by the present invention. The dispensing orifice may be centrally located on the base cap top. More often, the
- 110 dispensing orifice is offset towards one side in alignment with the center line of the hinge. The rib means thus also aligns the dispensing orifice with the container.

- Means are normally provided for sealing the base cap to the container neck as the closure is attached to the container. The seal functions to prevent leakage of the product that is contained in the container from between the closure and the container, independent of normal dispensing through the dispensing orifice
- 120 on the base cap. This sealing means can take the form of an internal shoulder or an annular flange which extends downwardly from the top of the cap with a diameter to achieve an interference sealing fit with the outside diameter of the neck of the
- 125 container. A plug seal may also be utilised which includes an annular flange extending downwards from the top of the cap for engagement with the inside diameter of the neck of the container. Another type of seal involves an annular flange extending
- 130 downwardly from the top of the cap to form an

the base cap may be permanently attached to the container by the sealing means, as in the case of an annular gasket which is interposed between the lip of the container and the top of the cap and which is made of material which can be heat sealed or fused to both the closure and container after attachment of the closure on the container.

For use with a container having a neck with an outwardly extending flange and an axially extending slot formed on the neck, the base cap may be formed with a dispensing orifice in the top and a depending cylindrical skirt having an inwardly projecting bead for co-operation with the container flange. An axially extending, inwardly projecting positioning rib may be formed on the skirt so that the closure is attached to the container by aligning the positioning rib with the slot and pushing the cap onto the container, snapping the cap bead over the container flange with the positioning rib being retained in the slot, so providing the desired fixed orientation of the closure on the container. A plurality of circumferentially spaced guide ribs can be provided projecting inwardly from the skirt and extending axially downwardly from the top of the cap, tapering inwardly and merging into the skirt at a point below the top of the positioning rib. These guide ribs assist in centering the closure as it is aligned and attached to the container. The axially extending slot on the container may pass through the flange on the container, in which case the positioning rib may extend on the skirt from a point below the top of the cap to the bottom of the skirt. The axially extending slot may be formed on the container by a collar which is located above the flange on the container, and the positioning rib may extend to a point above the bead of the cap.

In one preferred embodiment the container may be provided with a threaded neck and a pair of circumferentially spaced outwardly projecting lugs which form a slot between them. One of the lugs preferably has a cam surface. The base cap may then be provided with corresponding internal threads in its depending cylindrical skirt for co-operation with the threads of the container. An inwardly projecting positioning rib on the skirt extending axially downwardly from the threads may then provide the required positioning. In this embodiment as the closure is threaded onto the container the positioning rib will pass over the cam surface on one of the lugs to be stopped by the other of the lugs in the slot to retain the closure in a fixed orientation relative to the container. Where there is no additional fastening means, the positioning rib will preferably extend downwards from the threads to the bottom of the skirt.

The threaded container may further include an outwardly projecting flange on the neck of the container below the outwardly projecting lugs. In this further embodiment an inwardly projecting bead is positioned on the skirt adjacent to the bottom of the skirt and the positioning rib extends to a point above the bead so that as the closure is attached to the container by threading the cap onto the container the bead is forced over the flange and the positioning

rib passes over the cam surface on one of the lugs, stopping the slot in contact with the other lug to retain the closure in the desired fixed orientation relative to the container.

In another embodiment the container can have a threaded neck with an outwardly extending flange below the threads which is notched to form a pair of diametrically aligned radially extending stop faces on the flange. In this embodiment, the depending cylindrical skirt of the base cap is provided with complementary internal threads for co-operation with the container threads, and with a segmented bead which projects inwardly from the skirt at its bottom. The rib means then takes the form of a pair of diametrically aligned inwardly projecting ribs on the skirt extending downwards between bead segments. The closure is attached to the container by threading the cap onto the container, forcing the bead segments over the container flange and abutting the ribs against the stop faces to provide a fixed orientation of the closure relative to the container.

In still another embodiment the container and closure contain complementary threads, and a co-operating flange is provided on the neck of the container and a bead on the skirt, the stop taking the form of a upwardly extending lug at the beginning of the container thread and a downwardly extending lug at the tail end of the container thread. In this case, the rib means will include an axially extending face at the beginning and tail end of the cap thread. The closure is attached to the container by threading the cap onto the container, forcing the bead of the cap over the flange of the container and continuing the threading on until the cap thread faces about the container lugs, thus providing the desired fixed orientation of the closure.

Various embodiments of the invention are illustrated in the accompanying drawings of which:-

Figure 1 is a perspective view, with parts broken away and in section, showing a closure embodying the invention applied to a container with a flange and stop slot finish;

Figure 2 is a perspective view of the closure of *Figure 1* showing a positioning rib;

Figure 3 is an enlarged fragmentary view in section showing the positioning rib in position as the closure is attached to the container;

Figure 4 is an exploded perspective view with parts cut away for clarity of another embodiment of the invention in which the stop slot does not extend through the container flange but is located in a collar above the flange;

Figure 5 is a fragmentary elevational view of the embodiment of *Figure 4* showing the location of the position rib;

Figure 6 is an exploded perspective view with parts broken away for clarity showing another embodiment of the invention in which the container finish is threaded and has spaced lugs forming a stop slot, and the closure is threaded and has a positioning rib which extends axially to the bottom of the cap skirt;

Figure 7 is a partial sectional view along line 7-7 of *Figure 6* showing details of the stop lugs;

Figure 8 is a partial elevational view of the closure of *Figure 6* showing the positioning rib extending axially on both sides of bead 34 to the bottom of the skirt;

5 *Figure 9* is an exploded elevational view of another embodiment of the invention, with the closure in section and its lid removed, for use on a threaded container having a snap flange which is notched to provide stop surfaces;

10 *Figure 10* is a bottom view of the closure of *Figure 9* showing details of the positioning ribs;

Figure 11 is a partial view as viewed along arrow 11 of *Figure 9* showing one of diametrically opposed stop surfaces formed on the container flange;

15 *Figure 12* is a fragmentary elevational section of the closure of *Figure 9* showing the relationship of the closure threads to the container threads when the closure bead has snapped over the container flange;

20 *Figure 13* is an exploded elevational view showing another embodiment of the invention for use on a threaded container having stop lugs positioned above a snap flange;

Figure 14 is a bottom view of the closure of *Figure 13*;

Figure 15 is a partial plan view of the container of *Figure 13*;

Figure 16 is an exploded view, with the closure in cross-section with the lid removed, showing another embodiment of the invention in which the container stops are formed at the ends of the container threads;

Figure 17 is a partial bottom view of the closure of *Figure 16*; and

35 *Figure 18* is a partial plan view of the container of *Figure 16*.

In the embodiments of *Figures 1 - 3* a dispensing closure 10 is designed for application to a container 12 which has a neck 14 and an integrally formed collar 16. The collar 16 includes a snap attachment flange 18 and an axially extending slot stop 20. Closure 10 includes a base cap 22 and a lid 24 connected to the cap 22 by a hinge 26. The base cap 22 has a flat top 28 containing a dispensing orifice 30. A cylindrical skirt 38 depends from the top 28 and contains fastening means in the form of an inwardly directed bead 34 which co-operates in use with container flange 18 as they snap over each other to attach closure 10 to container 12.

A positioning rib 36 projects inwardly from the skirt 38 and extends axially on both sides of bead 34 to the bottom of the skirt. As seen in *Figures 2 and 3*, positioning rib 36 has a vertical inside surface and increases in thickness as it extends axially downwards as the skirt 38 tapers outwardly with an upper portion 40 above bead 34 and a lower portion 42 below bead 34.

The closure 10 is provided with a sealing means in the form of a plug seal shown as an annular flange 44 extending downwardly from top 28 of the cap 22. The flange 44 has an inwardly tapered cam surface 46 for guiding the flange into the neck 14. Additionally or alternatively the upper surface rim of the neck 14 may be chamfered to assist in guiding the flange 44 into the neck. The base cap 22 is further provided

with circumferentially spaced guide ribs projecting inwardly from the skirt and tapering inwardly as they extend downwards from the top 28, merging into the skirt at a point below the top of the positioning rib 36.

70 In assembly, after the container has been filled, the closure 10 is attached to the container 12 by aligning the positioning rib 36 with the slot 20 of the container and pushing on lid 24. The guide ribs 48 centre the cap on the container neck 14 and the cam surface 46 guides the flange plug seal 44 into the interior of the neck 14 as the closure is pushed onto the container 12. The bead 34 of the cap snaps over the flange 18 of the container with the positioning rib 36 being retained in the slot 20 and so providing a desired fixed orientation of the closure 10 with respect to the container 12. This provides for the alignment of the hinge 26 and the dispensing orifice 30 with the front of the container, which may contain a label surface 50. Lid 24 has a downwardly projecting closure plug 52 which closes the dispensing orifice 30 when the lid is in its closed position. The capture of positioning rib 36 in the container's stop slot 20, with the closure's bead 34 and container's flange 18 snapped over each other, creates a virtually permanent retention of the closure 10 in its desired orientation relative to the container 12.

In the embodiment of *Figures 4 and 5*, similar reference numerals are given to similar structures. The container, or bottle, 12 has a neck or finish, which has collar 16 immediately above but not continuous with flange 18, and slot 20 extends through collar 16 but not through flange 18. Positioning rib 36, as seen on *Figure 5*, extends to a point above bead 34 of the closure. An annular gasket 54 has been substituted for plug seal 44 and may be of the type to heat fuse the closure 10 to container 12 or it may be of a passive material.

The lid of the closure has been cut away in *Figure 4* to show more of the details of a two-piece closure in which the lid 24 and the base cap 22 are moulded separately with hinge posts 56 extending upwardly from the top 28 of the cap to be received in slots, not shown, in the lid 24. Alternatively, the closure is moulded in one piece with the lid joined to the base cap by a live hinge. Slot stop 20 in the container confines positioning rib 36 as the bead 34 is snapped over flange 18 in a manner similar to the embodiment shown in *Figures 1 - 3*.

In the embodiment shown in *Figures 6 - 8*, the container finish is shown with a thread 58 on its neck 14, and a stop slot 20 has been provided between a pair of spaced outwardly projecting lugs 60 and 62 at the base of the neck. As shown in *Figure 7*, the lug 62 has a cam surface 64.

120 In this embodiment, the positioning rib 36 extends all the way to the bottom of skirt 38 as in the embodiment of *Figures 1 - 3*, and a complementary thread 66 is provided for engagement with the thread 58 of the container. As cap 22 is threaded onto the container 12, positioning rib 36 will pass over cam surface 64 on lug 62, snapping into stop slot 20, and being stopped by abutment with lug 60. As in the former embodiments, retention in the desired orientation is maintained by the capture of the positioning rib 36 in the stop slot 20.

In the embodiment shown in Figures 9 to 12, the container neck 14 is provided with fastening means in the form of external threads 68 and flange 18. The container stop is provided by a pair of diametrically aligned, radially extending stop faces 68 formed on the flange 18 by tangential notches, one of which is shown in Figure 11. The closure 10 is provided with complementary threads 66 and a closure bead 34 taking the form of individual segments 70. The positioning rib means includes a pair of inwardly projecting, axially extending ribs 73 which are located in diametrically opposed positions between adjacent bead segments 70. The closure 10 is attached onto the container by threading cap 22 onto neck 14 which forces bead segments 70 over flange 18. Threading is continued until the ribs 73 abut against the stop faces 68. The ribs 73 are not positively captured by a stop slot, but will stay positioned in abutment with the container's stop surfaces 68, particularly in view of the fact that the threads 68 of the closure are separated from the threads 68 of the container by the axial movement created when closure bead 34 snaps over flange 18 as shown in Figure 12. The top 28 is provided with a downwardly extending annular flange 72 which is commonly referred to as a 'crab claw' which acts as a seal when it contacts the upper lip of container neck 14 during the attachment process.

The container finish of the embodiment shown in Figures 13 - 15 contains dual attachment means in the form of threads 58 on neck 14 and a flange 18, similar to the embodiment of Figures 9 - 12. In this instance the stop on the container is provided by a pair of circumferentially spaced outwardly extending lugs 74, one or both of which have cam surfaces 76. The lugs 74 define between them a slot stop 20. The lugs 74 about the top of the flange 18. The cap 22 is provided with complementary threads 66 at the upper end of skirt 38 and a segmented bead 34 at its lower end. A single positioning rib 36 extends axially downwards from a point below threads 66 to a point above bead 70. As cap 22 is threaded onto neck 14, the segmented bead 34 is forced over the flange 18 and the positioning rib 36 moves over cam surface 76 on lug 74 to be captured in the stop slot 20 to retain the closure on the container in the desired orientation.

In the embodiments of Figures 16 - 18, the container finish has dual fastening means in the form of threads 58 and flange 18, as in the two previous embodiments, but the stop surface is in the form of an upwardly extending lug 76 at the beginning of the container thread 58 and a downwardly extending lug 78 at the tail end of the thread 58. Similarly, the closure 10 has a complementary thread 66 and an inwardly projecting bead 34. The positioning rib means include an axially extending face 80 at the beginning of threads 66 and an axially extending face 82 at the tail end of threads 66. The closure 10 is attached to the container 12 by threading cap 22 onto the container which forces beads 34 over flange 18. Threading is continued until the thread faces 80 and 82 of the cap abut against the respective lug surfaces 76 and 78 of the container. This provides the desired fixed orientation of the closure relative to the

container.

CLAIMS

1. A dispensing closure for use with a container which has a neck provided with means for attaching the container to the closure and an axial stop, the closure comprising a base cap having a top which has a dispensing orifice and from which depends a cylindrical skirt having complementary means for attaching the closure to the container, a lid joined by a hinge to the base cap so that the lid can be swung from a closed position in which it covers the dispensing orifice to an open position in which the contents of the container may be dispensed through the dispensing orifice, the dispensing closure also comprising axially extending rib means projecting inwards from the skirt at a fixed orientation relative to the hinge, the arrangement being such that when the closure is attached to the container the rib means of the closure contact the stop of the container and thereby establish in use a fixed orientation of the hinge and lid opening with respect to the container.
2. A dispensing closure according to claim 1 which further comprises means for sealing the base cap to the neck of the container as the closure is attached to the container.
3. A dispensing closure according to claim 2 in which the means for sealing the base cap to the neck includes an annular flange extending downwardly from the top of the flange having a diameter for an interference sealing fit with the outside diameter of the container neck.
4. A dispensing closure according to claim 2 in which the sealing means for sealing the base cap to the neck includes an annular flange extending downwardly from the top of the cap for engagement with the inside diameter of the neck to form a plug seal.
5. A dispensing closure according to claim 4 in which the annular flange forms the plug seal as the closure is attached to the container by pushing the cap onto the neck.
6. A dispensing closure according to a claim 2 in which the neck terminates in a flat annular lip, and the means for sealing the base cap to the neck includes an annular flange extending downwardly from the top to form an annular sealing fin for contact with the annular lip.
7. A dispensing closure according to any preceding claim in which the neck terminates in an annular flat lip and the means for sealing the base cap to the neck includes an annular gasket interposed between the lip and the top of the cap as the closure is applied to the container.
8. A dispensing closure according to any preceding claim in which the base cap is formed with an internal shoulder at the juncture of the top of the skirt and the shoulder forms a secondary seal with the outside diameter of the neck.
9. A dispensing closure according to any preceding claim in which the lid is formed separately from the base cap, and the hinge includes posts on one of the cap and the lid and slots on the other of the cap and the lid for receiving the posts.

10. A dispensing closure according to any preceding claim in which circumferentially spaced guide rib project inwardly from the skirt and extend axially downwards from the top, the guide ribs
5 tapering inwardly and centering the closure as it is aligned with and attached to the container.

11. A dispensing closure according to any preceding claim in which the means for attachment of the closure includes an outwardly projecting
10 flange on the container neck and the means for attachment of the container includes a complementary bead projecting inwardly from the cap skirt, and in which the stop comprises an axial slot provided on the neck and the rib means includes
15 an axially extending positioning rib, the closure being adapted to be attached to the container with the rib retained in the slot so as to provide a fixed orientation of the closure relative to the container.

12. A dispensing closure according to claim 11 or
20 dependent on claim 10 in which the guide ribs merge into the skirt at a point below the top of the positioning rib.

13. A dispensing closure according to claim 11 or claim 12 in which the axial slot extends through the
25 flange and the positioning rib extends on both sides of the bead.

14. A dispensing closure according to claim 11 or claim 12 in which the slot is formed above the flange and the positioning rib extends to a point above the
30 bead.

15. A dispensing closure according to claim 11 or claim 12 in which the axially extending slot on the container passes through the flange, and the
35 positioning rib on the skirt extends from a point below the top to the bottom of the skirt.

16. A dispensing closure according to claim 11 or claim 12 in which the axially extending slot on the container is formed in a collar above the flange, and the positioning rib extends to a point above the bead.
40

17. A dispensing closure according to any one of claims 11 to 16 in which the closure is adapted to be attached to the container by aligning the positioning rib with the slot and pushing the cap onto the container to snap the bead over the flange.
45

18. A dispensing closure according to any of claims 1 to 16 in which the container and the closure are attached to each other by means which includes complementary threads provided on the container and the closure and in which the stop comprises a
50 pair of circumferentially spaced outwardly projecting lugs on the neck between which a slot is formed and one of the pair of lugs has a cam surface so that as the closure is threaded onto the container the rib means of the cap pass over the cam surface
55 on the one lug and are stopped by the other of the lugs in the slot and so retain the closure in a fixed orientation relative to the container.

19. A dispensing closure according to claim 18 in which the container and closure are adapted to be
60 fastened together by the provision of complementary threads on the container and the closure and also by the provision of an outwardly projecting flange on the neck which in use co-operates with a segmented bead which projects
65 inwardly from the skirt, and in which the stop

comprises a pair of diametrically aligned radially extending stop faces formed in the flange and the rib means comprises a pair of diametrically aligned inwardly projecting ribs extending between bead
70 segments, the closure being adapted to be attached to the container by threading the cap onto the container to force the bead segments over the flange and abut the ribs against the stop faces to provide a fixed orientation of the closure relative to the
75 container.

20. A dispensing closure according to claim 19 in which the stop faces are provided by notches in the flange.

21. A dispensing closure according to any one of
80 claims 1 to 16 in which the container and the closure are provided with complementary threads by which they are adapted to be attached together and which further includes a bead projecting inwardly from the skirt which is adapted to co-operate in use with an outwardly projecting flange on the neck of the container, and in which the stop comprises an
85 upwardly extending lug at the beginning of the thread on the container and a downwardly extending lug at the tail end of the thread on the container and the rib means comprises axially extending faces at the beginning and tail end of the thread on the cap, the closure being attached to the container by
90 threading the cap onto the container to force the bead over the flange and continuing threading the cap on until the cap thread faces abut the lugs on the container, thus providing a fixed orientation of the closure on the container.

22. A dispensing closure according to claim 18 in which the rib means of the cap which is trapped in
100 the slot defined by the two lugs comprises an inwardly projecting positioning rib provided on the skirt extending downwardly from the threads.

23. A dispensing closure according to claim 21 in which the positioning rib extends downwardly from
105 the thread to the bottom of the skirt.

24. A dispensing closure substantially as described herein as illustrated with reference to Figures 1 to 3 of the accompanying drawings.

25. A dispensing closure substantially as described herein as illustrated with reference to
110 Figures 4 and 5 of the accompanying drawings.

26. A dispensing closure substantially as described herein as illustrated with reference to Figures 6 to 8 of the accompanying drawings.

27. A dispensing closure substantially as described herein as illustrated with reference to
115 Figures 9 to 12 of the accompanying drawings.

28. A dispensing closure substantially as described herein as illustrated with reference to
120 Figures 13 to 15 of the accompanying drawings.

29. A dispensing closure substantially as described herein as illustrated with reference to Figures 16 to 18 of the accompanying drawings.